

REMARKS

Claims 1-2 are pending and claim 1 is the sole independent claim. Claim 1 has been amended to include the feature of an injection heater for vaporizing and injecting a hydrogen peroxide solution in mixture with air into the sterilization chamber. Support for this amendment is provided in the originally filed specification at page 4, line 27-page 5, line 1; page 5, lines 18-21; and page 6, lines 4-6. This injection heater is also referenced as component (30) in Figure 1.

No new matter has been added.

ARGUMENTS

The present invention is directed to a dehumidifier-equipped plasma sterilizing apparatus in which an injection heater is provided for vaporizing and injecting a hydrogen peroxide solution in mixture with air into the sterilization chamber. The water vapor contained in the discharged gas, after being used for the sterilization of objects, is freeze-condensed so as to prevent the entry of the water vapor into the vacuum pump and the corrosion of parts of the vacuum pump, thereby extending the interval between regular maintenance and parts change.

In the final Office Action, claim 1 is rejected under 35 U.S.C. §103(a) as being obvious over U.S. Patent No. 5,656,238 to Spencer et al. (hereinafter referred to as "Spencer") in view of U.S. Patent No. 6,261,518 to Caputo et al. (hereinafter referred to as "Caputo"). Claim 2 is rejected under 35 U.S.C. §103(a) as being obvious over Spencer in view of Caputo and further in view of U.S. Patent No. 6,519,956 to Bagley (hereinafter referred to as "Bagley").

Applicant respectfully traverses these rejections.

The final Office Action asserts that Spencer teaches all of the limitations of the claims except for a dehumidifier associated with the exhaust pipe of the vacuum chamber. Applicant disagrees. Spencer actually teaches a plasma-enhanced vacuum drying method wherein multiple evacuations of the products to be sterilized are performed prior to application of the plasma to remove excess moisture from the products and reduce the sterilization time. Spencer fails to suggest incorporating any type of dehumidifier into the device for drawing off this excess moisture before it cycles through the vacuum pump. Caputo is cited as teaching a condenser in-line between a vacuum chamber and a vacuum pump. The final Office Action

asserts that the condenser acts as a dehumidifier as it removes evaporated water generated from the vacuum chamber and flows through the exhaust pipe. However, the “dehumidifier” of Caputo, is actually a condenser which is positioned in-line between a lyophilizer chamber and a vacuum pump for freeze-drying pharmaceuticals, such as liquid suspension, for preservation. Accordingly, none of the art of record teaches the use of a dehumidifier in-line between a sterilization chamber and a vacuum pump for removing excess water vapor resulting from a hydrogen peroxide sterilization process to prevent the water vapor by-product from cycling through the vacuum pump.

Furthermore, claim 1 has now been amended to include the feature of a heat injector for vaporizing and injecting a hydrogen peroxide with air, which is used as a precursor for germicidally active material, and that the vacuum pump is operated to remove excess water vapor resulting from the hydrogen peroxide during and after the sterilization process. None of the art of record teaches an injection heater for vaporizing and injecting a hydrogen peroxide solution in mixture with air into the sterilization chamber.

In response to the arguments set forth in the Response filed October 12, 2007, the final Office Action asserted that, with respect to Caputo, while the chamber (312), condenser (314) and vacuum pump (316) are also used to perform/assist in the preservation of the pharmaceuticals, these devices primarily form a part of a sterilization apparatus, and the condenser removes any resulting water vapor during the sterilization process. Applicant disagrees. Caputo teaches several sterilization systems, yet the only system that teaches a condenser is the system that includes a lyophilizer chamber, as illustrated in Figure 8 of the reference. Thus, condenser (314) is provided in the Figure 8 embodiment to remove the water by-products resulting from freeze-drying of the pharmaceuticals, not for removing water by-products from the sterilization gas. For these reasons, Caputo fails to teach that the condenser is provided to prevent entry of water vapor into the vacuum pump.

The final Office Action further asserts that, “It is known in the sterilization art to provide a dehumidifier (condenser) in an exhaust pipe of a sterilization chamber and prior to a vacuum pump in order to remove water vapor as exemplified by Caputo.” Applicant respectfully disagrees. The only thing “exemplified” by Caputo is the use of a condenser with a lyophilizer

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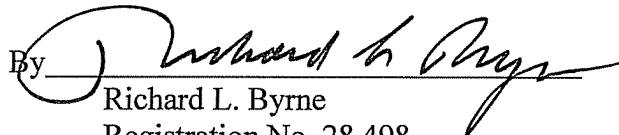
chamber, not a sterilization chamber such as taught by Spencer. For this reason, the combination suggested in the final Office Action fails to teach the claimed invention. Additionally, with respect to Spencer, the final Office Action asserts that Spencer does not include a specific written teaching that states a dehumidifier should not be utilized as a part of the apparatus. Spencer does teach the sterilization of items in which an excessive amount of moisture is removed. However, even though this excess moisture is present, Spencer provides no suggestion or teaching that this excessive moisture is a concern with respect to the vacuum equipment.

With respect to claim 2, the final Office Action states that it is well-known in the art to use a dehumidifier to remove water from an air stream and relies on Bagley as merely teaching a dehumidifier which is comprised of a compressor, a condenser, an expansion valve and a freezer. Bagley fails to overcome the deficiencies of the combination of Spencer with Caputo as none of the cited art teaches or suggests the features of independent claim 1.

CONCLUSION

Based on the foregoing remarks, reconsideration of the rejections and allowance of claims 1 and 2 are respectfully requested.

Respectfully submitted,
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